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MYOCARDIAL ISCHEMIA AND INFARCTION

ABSOLUTE MYOCARDIAL PERFUSION AND CFR CAUSING ISCHEMIA DURING MYOCARDIAL STEAL BY QUANTITATIVE PET

ACC Poster Contributions
Ernest N. Morial Convention Center, Hall F
Tuesday, April 05, 2011, 9:30 a.m.-10:45 a.m.

Session Title: Stable Ischemic Syndrome: Biomarkers
Abstract Category: 5. Stable Ischemic Syndrome
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Background: Myocardial steal occurs when perfusion during stress falls below resting levels and coronary flow reserve (CFR) is less than 1.0. It occurs most commonly with occluded collateralized arteries, disease of the supply arteries, or severe diffuse CAD. Some patients develop angina during myocardial steal while others do not, thereby providing a model for determining the flow threshold causing ischemia clinically.

Methods: Patients underwent rest-dipyridamole stress perfusion PET using Rb-82 with absolute flow determined in cc/g/min. The worst stress flow and worst CFR value averaged over an approximate 2.5 cm2 area were adjusted for the pressure-rate product (PRP) to account for variable myocardial oxygen demand. ST changes on ECG recording and angina were monitored during imaging. Ischemia was classified as both angina and >1mm ST depression during stress.

Results: 41 (27%) of 152 patients with myocardial steal had ischemia. Worst stress flow was 0.19±0.09 (cc/g/min at 6000PRP) in patients with ischemia and 0.27±0.13 without ischemia (p<0.001). Worst CFR was 0.51±0.17 (at 6000PRP) in patients with ischemia and 0.61±0.20 without ischemia (p=0.003). The cutoff threshold best separating ischemia from no ischemia was a worst stress flow 0.20 cc/g/min at 6000PRP with a C-statistic=0.69.

Conclusions: Quantitative flow by PET identifies the absolute perfusion threshold in cc/g/min and CFR for ischemia in patients with decreased perfusion due to myocardial steal during vasodilator stress.